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are generated by touching the light pen to a control pad or by drawing with the light pen on any one of the three drawing pages. When the video processor is in RE-CEIVE MODE, all screen manipulation commands and screen drawing is derived from decoding the bit stream from the modem link via the DART from the audio processor. This separation is illustrated in FIG. 13.

Now that the pen is taken, drawing from the transmitting device to the receiving device may be accomplished. All of the video code which handles local operations such as drawing, erasing, clearing the screen, etc., also has code to encode these operations into commands and data to be sent across the modem link. The code that generates and sends these commands and data is enabled to operate only when the pen is taken and the video processor is in TRANSMIT MODE. This means that the transmit side of the modem is dispersed throughout all of the local operation routines in the video code. There are some common points of the transmit code and two of them are shown in FIG. 13. They are the byte transfer code to the audio processor and the underflow code which inserts non-operation codes (NOPS) into the modulation bit stream when the pen is idle.

When drawing on the surface of the screen on one of the drawing pages the light pen hits are averaged every other NMI at a 30 HZ rate. These averaged hits are encoded and sent across the modem link. On both the transmitting and receiving units, the averaged hits are sent to a linear interpolator routine which turns the spaces between the hits into line segments. The output of the linear interpolator is then sent to a moving average filter routine which smooths out the resulting line segments to make the drawn image more continuous.

The output of the moving average filter is a list of elements which are displayed on the video screen during vertical sync time. The video processor only has access to the bit mapped screen ram during vertical sync time.

When the transmitting device is done drawing and the user wishes to give up the pen the light pen should be touched to the GIVE (formerly TAKE) pad. Touching this pad causes the GIVE word on the pad to change to TAKE and causes the word TRANSMIT in the lower right to change to the PHONE pad. Also, the audio processor is commanded to cease modulation and place itself into CARRIER DETECT MODE.

Meanwhile, when the receiving device detects the GIVE COMMAND it removes itself from RECEIVE MODE and places itself into CARRIER DETECT MODE.

To hang up the device, a user presses the light pen to the PHONE pad. This pad hit is decoded and causes the video processor to display the phone page. Touching the HANGUP pad commands the audio processor to command the DCPH to place the phone line on hook.

Although a preferred embodiment of the present invention has been described, other variations are of course possible. For instance, in another embodiment, the present invention could be incorporated with a digital telephone PBX thereby obviating the need for converting data between digital and analog formats. In addition, the present invention could be utilized to permit graphics only transmission, utilizing the telephone accessing scheme described above. It is intended therefore that the scope of the present invention only be limited by the accompanying claims.

What is claimed is:

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1. An integrated audiographics communications system comprising
a common telephone line,
a plurality of audiographics telephone terminals connected to said common telephone line, each of said terminals including
means for dialing a telephone number to establish a single telephone connection between two or more of said terminals,
display means,
light pen means for enabling a user to visually write text or draw graphics information on said display means,
means for simultaneously transmitting and receiving data over only said signal telephone connection, said data including spoken audio information and digital text or graphics transmit information,
said display means including means for visually displaying said received text or graphics data, thereby providing a common display between said terminals having an ordinary telephone connection to one another,
an integrated speakerphone for providing an audio speech signal corresponding to said spoken audio data simultaneously with the visually displayed text or graphics data,
means for generating said digital graphics transmit information corresponding to said written text or drawn graphics information, and
audio means for generating audio transmit information corresponding to spoken audible information.

2. A system as in claim 1 including video processing means for processing said graphics data and audio processing means for processing said audio data.

3. A system as in claim 2 wherein said audio means includes digital filter means for filtering said audio data.

4. In an integrated audiographics system including a plurality of audiographics telephone terminals connected to a common telephone line, each of said terminals comprising
means for establishing a telephone connection with one or more of said terminals,
display means,
light pen means for enabling a user to visually write text or draw graphics information on said display means,
means for transmitting data over said common telephone line to another one of said terminals, said data including audio and text or graphics information,
means for receiving said transmitted data over said common telephone line from another of said terminals,
said display means including means for visually displaying said received text or graphics data thereby providing a common visual display between said terminals having a telephone connection to one another, and
an integrated speakerphone for providing an audio signal corresponding to said received audio data simultaneously with said displayed text or graphics data.

5. A system as in claim 4 wherein each of said terminals include
means for generating graphics transmit data corresponding to said written text or graphics data,
means for generating audio transmit data corresponding to audible data,